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(19) **United States**(12) **Patent Application Publication****Goodenough et al.**(10) **Pub. No.: US 2016/0368777 A1**(43) **Pub. Date: Dec. 22, 2016**(54) **WATER SOLVATED GLASS/AMORPHOUS
SOLID IONIC CONDUCTORS****H01G 11/84** (2006.01)**C01B 33/24** (2006.01)**C01D 5/02** (2006.01)**C01F 11/46** (2006.01)**C01B 25/30** (2006.01)**C01B 25/32** (2006.01)**H01M 8/1016** (2006.01)**C01B 11/00** (2006.01)(71) Applicants: **Board of Regents, The University of
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TX (US)**(52) **U.S. Cl.****CPC** **C01B 33/32** (2013.01); **H01M 8/1016**
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(2013.01)(21) Appl. No.: **15/178,228**(22) Filed: **Jun. 9, 2016****Related U.S. Application Data**(60) Provisional application No. 62/181,606, filed on Jun.
18, 2015, provisional application No. 62/189,865,
filed on Jul. 8, 2015.**Publication Classification**(51) **Int. Cl.****C01B 33/32** (2006.01)**H01M 10/36** (2006.01)**H01G 11/62** (2006.01)(57) **ABSTRACT**

The disclosure provides a water-solvated glass/amorphous solid that is an ionic conductor-an electronic insulator, and a dielectric as well as electrochemical devices and processes that use this material, such as batteries, including rechargeable batteries, fuel cells, capacitors, electrolysis cells, and electronic devices. The electrochemical devices and products use a combination of ionic and electronic conduction as well as internal electric dipoles.